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STANFORD UNIVERSITY SCHOOL OF MEDICINE  
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Dear Dr. Starr:

Your letter of Dec. 4 (and your paper in Science which I had already noted with great interest) raises, as you well know, too many questions to be dealt with in the space of a letter. I will make a few comments, will gladly enclose and continue to send other pertinent writings, and will also respond to the idea of a more intimate discussion -- especially if we can schedule it for just one day in LA or here. ('Here' might possibly be the Center for Beh. Sci., where there are surely several people whom you would wish to recruit.)

I was intrigued by your effort at an economic analysis; but this has even more than the usual defects of the oversimplification of the model of a perfect market for value theory. Consider inverting the argument, whether you can establish an economic value to a life by empirical analysis; and you will of course find an enormous variation with context -- from a negative value in the context of population control, to some \$10<sup>9</sup> for a highly visible, specifically identified astronaut, to "infinite" in some thought-less idealizations. I also have some concern that system games may be mischievous if they incorrectly identify the value functions. (For example, I have had great trouble lately over standards of planetary quarantine ~~because~~ because of Sagan's model that postulated (1) a static estimation of the stakes, rather than as a function of knowledge of Mars sequentially acquired at some risk, and (2) his having played all the stakes on the chance to do a clean trial for the occurrence of extraterrestrial life, rather than currently unspecifiable exploitations of Mars and its potential inhabitants. )

Consider how far we are from a rational expenditure of potential life-saving resources, in such fields as smoking and auto safety. What our society is willing to pay for safety depends on a great many extra-economic factors -- the precision of our understanding of hazards (at a rational level) and such cultural influences as mass advertising....

I believe it is not overwhelmingly difficult to ~~calculate~~ estimate explicit risks in most of the fields of concern. There may also be large uncertainties, and we have to analyse the cost-effectiveness of not making the investments to reduce those uncertainties. (Consider the impact of the unresolved possibility that our current estimates of health hazards of radiation are too optimistic by one or even two bels.)

What I find more baffling is how to assess the impact of new <sup>(ess.)</sup> ~~and~~ imbalanced technology on our institutions; and one can ask the same question of the technology of technology-assessment. What are the losses if the spirit of inquiry is stifled by our timidity from having been burned by past excesses? Or to take another example, how many lives are saved by the use of automobiles for access to medical care at urban centers? (I do not think our market mechanism correctly factors this into our investment in transportation.).

A more pertinent example: U.S. technology in nuclear energy and in metallurgy and aircraft is the foundation of our military and foreign policy. The costs and benefits of that policy are issues that overwhelm every other question you raise.

Forgive the vagrancy of these thoughts. This may well illustrate the need for a conference such as you suggest. The Nobel-14 Symposium was theoretically supposed to be directed at similar matters, and never did -- but it lacked the quantitative orientation that you seek and I admire.